

REMARKS

Specification

The specification has been amended to include the patent number of the parent application.

Claims

Claims 15-25 were rejected in the Office Action dated April 14, 2005. Claims 26 and 27 were objected to. Claims 28-32 are added by this amendment. Reconsideration of all rejected claims is respectfully requested in light of the arguments presented below.

Claim Rejections under 35 USC §103

Claims 15-25 were rejected under 35 U.S.C. §103(a) as being unpatentable over Cave et al. ("Cave"), U.S. Patent No. 5,563,779 in view of Applicant's Prior Art. With respect to claim 15, the Office Action stated, "Fig. 2 [of Cave] does not appear to disclose a wordline application as recited in claim 15," but stated that it would have been obvious to implement the circuit of Fig. 2 to supply a wordline, "for the benefit of supplying a high constant voltage" based on the Background of the Invention ("background"). However, the background does not appear to provide a motivation to modify Cave for a wordline application.

The background discusses the limitations of certain prior art charge pumps and the desirability of a "charge pump with ripple reduction capability," column 3, lines 5-6. However, there is no indication in the background that a charge pump with variable capacitance would provide such capability; nor does Cave appear to suggest such a combination. Cave appears to provide variable capacitance to regulate an output in response to load variations and battery supply variations, see column 2, lines 12-23. Cave does not appear to address the problem of ripple reduction for a load such as a wordline. In fact, Cave appears to show a feedback mechanism that would produce variation in output as capacitance is repeatedly altered according to an algorithm (see Figures 3-5). It is not seen how such an output would suggest use with a wordline.

The Office Action appears to apply an "obvious to try" standard in this rejection. Disclosing a charge pump that could have been used with a wordline does not make such

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a combination obvious without some suggestion or motivation to make the claimed combination. While with hindsight, the advantages of this combination may be seen, there appears to be no prior suggestion that such a combination might be advantageous. Therefore, claim 15 is submitted to be allowable because the Office Action has not shown a *prima facie* case of obviousness.

Claims 16-18 depend from claim 15 and are therefore submitted to be allowable, at least as depending from an allowable independent claim. In addition, claim 16 recites, "the reduced current is approximately equal to the leakage current." Cave does not appear to show a leakage current as a load for a charge pump. Matching the reduced current to the leakage current in this way provides a constant voltage on the wordline with little or no use of feedback, thus providing ripple reduction. Therefore, claim 16 is submitted to be additionally allowable over Cave.

Claim 18 recites, "reducing a voltage used in one or more stages in response to the signal." No such reduction appears to be shown by Cave. The Office Action stated, "The reduction in capacitance would result in a reduction of voltage within the stage." This appears to refer to the output voltage V_{out} that is a function of capacitance. However, V_{out} does not appear to be a voltage used in the stage. V_{out} appears to be the voltage produced by the stage by using other voltages such as V_{DD} and V_{SS} . Voltages V_{DD} and V_{SS} do not appear to be reduced.

Claim 19 recites, "reducing a voltage used in one or more stages of the charge pump in response to the signal." This limitation is similar to that of claim 18 above. Cave does not appear to show reducing a voltage used in a stage in response to a signal. Claim 20 is submitted to be allowable at least for depending from claim 19.

Claim 22 was rejected for the same reasons as the previous claims. No *prima facie* case of obviousness appears to be made with respect to claim 22 because no adequate motivation is shown to combine the charge pump of Cave and a wordline.

Claims 23-25 are submitted to be allowable at least for depending from an allowable base claim. In addition, claim 25 recites, "the first current is used to charge the wordline and the second current is used to maintain the wordline at the predetermined voltage." The additional limitations do not appear to be shown by Cave. In particular,

Cave appears to disclose a regulated supply for maintaining a voltage to a load but does not appear to disclose a current used to charge a load.

Claims 19-21 were rejected under 35 U.S.C. §103(a) as being unpatentable over Yokomizo et al. ("Yokomizo"), U.S. Patent No. 6,400,211 in view of Applicant's Prior Art. However, a *prima facie* case of obviousness requires a suggestion or motivation to combine the references and no such suggestion or motivation appears to be shown here. The Office Action states, "It would have been obvious to one of ordinary skill in the art to implement the circuit of Fig. 1 [of Yokomizo] to supply a wordline for the benefit of supplying a high constant voltage." This appears to be a reason to use a charge pump with a wordline, but not a reason to use the particular charge pump of Yokomizo.

Yokomizo discloses that a problem with certain prior art pumps is that they use variable frequency to control the output voltage, "since the frequency of the oscillation circuit varies, the frequency of the noises likely varies which makes difficult to remove the noises by a filter," column 2, lines 54-56. To solve this problem, Yokomizo discloses a charge pump that varies a voltage used in a charge pump according to the output voltage, but keeps frequency constant, "since the switching frequency is kept constant, a circuit which facilitates noise removal in the surrounding circuits can be realized," column 3, lines 54-56. However, no improvement in switching noise appears to be achieved by the charge pump itself so that connecting this charge pump to a wordline would not appear to provide a more constant voltage. In short, Yokomizo appears to teach a charge pump that produces filterable noise, not reduced noise. This does not appear to suggest the use of such a charge pump in a wordline application.

The Office Action appears to apply an "obvious to try" standard in this rejection. However, disclosing a charge pump that could have been used with a wordline does not make such a combination obvious without some suggestion or motivation to make the claimed combination. While with hindsight, the advantages of this combination may be seen, there appears to be no prior suggestion that such a combination might be advantageous. Therefore, claim 19 is submitted to be allowable because the Office Action has not shown a *prima facie* case of obviousness.

Claims 20 and 21 are submitted to be allowable as depending from an allowable base claim. In addition, claim 21 recites, "the second current being approximately equal

to a leakage current from the wordline." This limitation does not appear to be shown by Yokomizo because Yokomizo does not disclose either a wordline or any other load having a leakage current.

New Claims


New claim 28 depends from claim 25. Claim 28 is supported throughout the specification, in particular at column 5, lines 31-37.

Claims 26 and 27 were objected to as being dependent upon a rejected base claim, but were indicated to be allowable if rewritten in independent form including all of the limitations of the base claims and any intervening claims. Claims 29 and 30 correspond to claims 26 and 27 in independent form. Claims 26 and 27 are canceled. Claims 31 and 32 depend from claim 29 and are submitted to be allowable at least for depending from an allowable base claim.

CONCLUSION

In view of the amendments and remarks contained herein, it is believed that all claims are in condition for allowance and an indication of their allowance is requested. However, if the Examiner is aware of any additional matters that should be discussed, a call to the undersigned attorney at: (415) 318-1163 would be appreciated.

Respectfully submitted,


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Date

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